CHAPTER 7.1
GENERAL INFORMATION
FOR GROUND WATER TREATMENT FACILITIES

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7.1-1. GENERAL. The following chapters of this document were developed to assist QA Representatives with inspections during construction and operation of ground water treatment facilities. The information provided covers items commonly overlooked or inadequately covered in specifications and questions that commonly arise during construction and operation activities. The EPA guidance document entitled "Remedial Technologies Screening Matrix and Reference Guide" (EPA/542/b-94/013) provides additional information about the treatment processes discussed in this document.

a. Presubmittal Conferences.

To facilitate major equipment submittals for a ground water treatment facility, presubmittal conferences may be held to clarify supplier requirements. The project designer, construction personnel, contractor, supplier, and applicable subcontractors are normally in attendance at these meetings.

b. Submittals.

(1) Almost all ground water treatment processes are comprised of several separate units that are connected by pumps and piping. Contractor submittals for each unit must be reviewed carefully prior to installation to ensure the units conform with the plans and specifications.

(2) The contractor should provide construction submittals as required by the specifications. The following is a list of typical submittal requirements:

(a) Permits or substantive requirements of permits;

(b) Contractor requirements for experience;

(c) Site, facility, and equipment layout; and

(d) Warranties.

7.1-2. PRODUCTS.

Material/Equipment Requirements.

(1) Many ground water treatment plants use chemicals and equipment that are very specialized. The chemicals can be hazardous. Review the Health and Safety precautions before using.

(2) Verify the materials and chemicals conform to the specifications. Seemingly small differences or oversights could result in serious failures.

(3) Materials must be compatible with all chemicals that they will come into contact with. For example, acids may require the use of special pipe. Deviation from the specifications could result in the pipe rapidly corroding and failing. An air stripper blower that is either over or under sized will cause the air stripper to perform below design standards. This might not be recognized until the

process is in operation and discharge permit limits are not being met.

(4) Assure that all ferrous materials and materials damaged by exposure to sunlight or water have been properly coated per the specifications.

(5) Verify that tank and piping dimensions are correct.

7.1-3. EXECUTION. It is important that during the initial startup and debugging of the plant that stream compositions, temperatures, pressures and flow rates of each unit in the process be measured to ensure they conform to the design. The designer of the plant and the equipment vendor should provide the detailed procedures to perform these tasks. The contractor should submit a detailed start-up and testing plan. The plan should be reviewed by the designer. Verify that the plant is operating according to design before entering the operations and maintenance phase. The failure of any one unit to perform as designed could cause the whole process to perform poorly or fail. Close cooperation with the designer and the vendor is critical to the timely startup and debugging of a new treatment process.

7.1-4. OPERATION AND MAINTENANCE.

a. Operator's Requirements. Licenses and certifications for treatment plant operators and supervisors vary from state to state. Operator licenses/certifications must be checked for compliance with contract specifications. Many processes/operations do not have full time operators. Contact the designer if it appears that the number of hours are not adequate to safely/properly operate the plant.

b. Operation and Maintenance Manuals. Verify that each piece of equipment has an O&M manual and a description of how that piece of equipment fits into the overall process. Verify that O&M manuals are complete and understandable. There should be one comprehensive O&M manual that describes how all equipment operates together. The operator should become familiar with the manuals. Keep track of each Government copy of the O&M manual. These manuals tend to disappear. Verify that all O&M activities are tracked in a log.

c. Piping and Instrumentation Diagrams. Verify that complete and detailed piping and instrumentation diagrams (P&ID’s) and computer logic diagrams for the entire process are supplied. These are needed to troubleshoot and isolate process control problems during startup and operation. Verify that the equipment safety shutdowns and safety interlocks are functioning.

d. Spare Parts. Ensure spare parts and special tools required in the specifications are provided. The contractor should inventory spare parts on a regular basis and provide reports indicating spare parts inventory and usage.

7.1-5. MONITORING SYSTEMS.

a. Instrumentation Controls. Instrumentation and controls are perhaps the most important aspect of the ground water treatment facility. The use of a pre-submittal conference between the designer, contractor, and instrumentation/control supplier can

prevent problems during construction. Adherence to plans and specifications is especially critical during installation of control sequences. All control loops should be physically verified to be sure they have been correctly installed and operate correctly. Close interaction with the designer to rectify problem areas will prevent future problems. Verify that each instrument has operating, calibrating and maintenance instructions and operates correctly.

b. Plant Operations and Compliance Monitoring. Typically there are three types of chemical sampling and monitoring required during plant operation. These are initial operation monitoring, routine operation monitoring and permit compliance monitoring.

(1) Verify that the purge line on the sampler has a location to discharge to (floor drain, etc.).

(2) Verify that the sampler has the capability of controlling the sample rate when sampling a pressurized line.

c. Laboratory Equipment and Supplies.

(1) Verify that the construction package has defined all utilities required within the laboratory area. For example, many laboratory hoods require gas piping for operation. If this is the case, ensure that the utility drawings indicate a gas feed.

(2) Determine if vacuum connections are required.

(3) Verify that all specified refrigeration units, cabinets, automated samplers, and equipment are provided.

(4) Perform an inventory of glassware, tubing, spare parts, etc. to be provided by the contractor before turnover of the plant.